

CLAIMS

What is claimed is:

1. A composition for fabricating a porous scaffold, the composition comprising:
 - a biodegradable unsaturated polymer;
 - a crosslinking agent; and
 - a porogen comprising biodegradable hydrogel microparticles.
2. The composition of claim 1 wherein:
 - the biodegradable unsaturated polymer is self-crosslinkable.
3. The composition of claim 1 wherein:
 - the crosslinking agent is a free radical initiator.
4. The composition of claim 1 wherein:
 - the crosslinking agent comprises a free radical initiator and a monomer capable of addition polymerization.
5. The composition of claim 1 wherein:
 - the hydrogel microparticles comprise collagen, a collagen derivative or mixtures thereof.
6. The composition of claim 1 wherein:
 - the hydrogel microparticles comprise crosslinked collagen, a crosslinked collagen derivative or mixtures thereof.
7. The composition of claim 1 wherein:
 - the hydrogel microparticles comprise a synthetic biodegradable polymer.

8. The composition of claim 1 wherein:
the hydrogel microparticles comprise a crosslinked synthetic biodegradable polymer.
9. The composition of claim 1 wherein:
the hydrogel microparticles comprise oligo(poly(ethylene glycol) fumarate).
10. The composition of claim 1 wherein:
the hydrogel microparticles comprise crosslinked oligo(poly(ethylene glycol) fumarate).
11. The composition of claim 1 wherein:
the hydrogel microparticles have a water content from about 20% to about 99% by volume.
12. The composition of claim 1 wherein:
the composition is injectable.
13. The composition of claim 1 wherein:
the biodegradable unsaturated polymer is selected from poly(propylene fumarate), poly(ϵ -caprolactone-fumarate), and mixtures and copolymers thereof.
14. The composition of claim 1 wherein:
the biodegradable unsaturated polymer comprises poly(propylene fumarate).
15. The composition of claim 1 wherein:
the hydrogel microparticles include entrapped water.
16. The composition of claim 1 further comprising one or more bioactive agents.

17. The composition of claim 1 further comprising one or more bioactive agents selected from enzymes, organic catalysts, ribozymes, organometallics, proteins, glycoproteins, peptides, polyamino acids, antibodies, nucleic acids, steroidal molecules, antibiotics, antimycotics, cytokines, growth factors, carbohydrates, oleophobic, lipids, extracellular matrix and/or its individual components, pharmaceuticals, and therapeutics.

18. The composition of claim 1 wherein:
the biodegradable unsaturated polymer is self-crosslinkable, and
the crosslinking agent is a free radical initiator.

19. The composition of claim 1 wherein:
the hydrogel microparticles comprise crosslinked collagen.

20. The composition of claim 1 wherein:
the hydrogel microparticles comprise crosslinked gelatin.

21. The composition of claim 1 wherein:
the biodegradable unsaturated polymer comprises self-crosslinkable poly(ϵ -caprolactone-fumarate),
the crosslinking agent is a free radical initiator, and
the composition is injectable.

22. The composition of claim 1 wherein:
the hydrogel microparticles have diameters in the range of 1 to 1000 micrometers.

23. A scaffold for tissue regeneration, the scaffold prepared by allowing any of the compositions of claims 1 to 22 to crosslink in a cavity or a mold.

24. The scaffold of claim 23 wherein:
the hydrogel microparticles comprise greater than 49% by volume and up to 99% by volume of the scaffold.

25. The scaffold of claim 24 wherein:
the hydrogel microparticles include entrapped water and physiologic fluid replaces the entrapped water after the scaffold is placed into or formed in a cavity in an animal or human body.

26. A method for fabricating a scaffold for tissue regeneration, the method comprising:

allowing any of the compositions of claims 1 to 22 to crosslink in a cavity or a mold.

27. The method of claim 26 wherein:
the cavity is in an animal or human body.

28. The method of claim 27 wherein:
the hydrogel microparticles include entrapped water and physiologic fluid replaces the entrapped water after the composition crosslinks in the cavity.